WHAT IS CLAIMED IS:

1. An apparatus for printing images from digital image data onto a light sensitive medium disposed at an image plane, the apparatus comprising:

(a) a control logic processor capable of controlling the operation of said apparatus for printing based on said digital image data;

(b) an image forming assembly for directing, onto said light sensitive medium disposed at said image plane, an exposure beam for printing, said image forming assembly comprising:

(1) a light source for providing light exposure energy for imaging onto said light sensitive medium;

(2) a first lens assembly for directing said light exposure energy to a spatial light modulator;

(3) a beamsplitter which directs said light exposure energy to said spatial light modulator;

(4) a spatial light modulator having a plurality of individual elements capable of altering a polarization state of said light exposure energy to provide an exposure beam for printing, a state of each of said elements controlled by said control logic processor according to said digital image data;

(5) a temperature profile control apparatus for controlling a temperature profile of said spatial light modulator; and

(6) a second lens assembly for directing said exposure beam onto said light sensitive medium.

2. The apparatus of claim 1 wherein said first lens assembly comprises a polarizer.

3. The apparatus of claim 1 wherein said beamsplitter comprises a polarizer.

4. The apparatus of claim 3 wherein said polarizer comprises a wire grid.

5. The apparatus of claim 3 wherein said polarizer comprises a pellicle and at least one linear polarizer.

6. The apparatus of claim 1 wherein said first lens assembly comprises a uniformizer.

7. The apparatus of claim 6 wherein said uniformizer comprises a fiber faceplate.

8. The apparatus of claim 6 wherein said uniformizer comprises a fiber fabric.

9. The apparatus of claim 1 wherein said light source provides a polarized light exposure energy.

10. The apparatus of claim 1 wherein said light source contains an infrared component.

11. The apparatus of claim 1 wherein said first lens assembly comprises a filter.

12. The apparatus of claim 11 wherein said filter comprises a color filter wheel.

13. The apparatus of claim 1 wherein said light source comprises a fiber.

14. The apparatus of claim 1 wherein said temperature profile controller comprises a heat sink.

15. The apparatus of claim 1 wherein said temperature profile controller comprises a thermo-electric cooler.

16. The apparatus of claim 1 wherein said temperature profile controller comprises a multi-element controller.

17. The apparatus of claim 1 wherein said temperature profile controller comprises a localized environmental controller.

18. The apparatus of claim 1 wherein said temperature profile controller provides a uniform temperature profile.

19. The apparatus of claim 1 wherein said temperature profile controller comprises a calculated profile.

20. The apparatus of claim 1 wherein said second lens assembly comprises a polarizer.

21. The apparatus of claim 1 wherein said second lens assembly comprises a beamsplitter.

22. The apparatus of claim 1 wherein said second lens assembly comprises a zoom lens.

23. The apparatus of claim 1 wherein said second lens assembly comprises a turret with at least two lenses.

24. The apparatus of claim 1 wherein said spatial light modulator is movable to at least two distinct locations.

25. The apparatus of claim 1 wherein said images are monochromatic.

26. The apparatus of claim 1 wherein said images are polychromatic.

27. The apparatus of claim 1 wherein said spatial light modulator comprises a transmissive LCD.

28. The apparatus of claim 1 wherein said spatial light modulator comprises a reflective LCD.

29. The apparatus of claim 1 wherein said spatial light modulator comprises a digital micromirror device.

30. The apparatus of claim 1 wherein said uniformizer comprises a lenslet array.

31. The apparatus of claim 1 wherein said uniformizer comprises an integrating bar.

32. The apparatus of claim 1 wherein said light source comprises a lamp.

33. The apparatus of claim 1 wherein said light source comprises at least one light emitting diode.

34. The apparatus of claim 1 wherein said light source comprises a laser.

35. The apparatus of claim 33 wherein an infrared rejecting filter is located between said light source and said uniformizer.

36. The apparatus of claim 1 wherein said image forming assembly further comprises a beamsplitter.

37. The apparatus of claim 1 wherein said image forming assembly further comprises a pellicle.

38. The apparatus of claim 1 wherein said image forming assembly further comprises a turning mirror.

39. The apparatus of claim 1 wherein said image forming assembly further comprises a prism.

40. The apparatus of claim 1 further comprising an actuator coupled to said spatial light modulator, said actuator disposed to provide motion for exposure dithering.

41. The apparatus of claim 40 wherein said actuator comprises a piezoelectric actuator.

42. The apparatus of claim 36 wherein said beamsplitter comprises a polarization coating.

43. The apparatus of claim 1 wherein said second lens assembly provides reduction of the image.

44. The apparatus of claim 1 wherein said second lens assembly provides magnification of the image.

45. The apparatus of claim 1 wherein said images are printed to said photosensitive medium and wherein said photosensitive medium is developed using a chemical bath.

46. The apparatus of claim 1 wherein said images are printed to said photosensitive medium and wherein said photosensitive medium is developed using heat.

47. The apparatus of claim 1 wherein said first lens assembly comprises an aperture.

48. The apparatus of claim 1 further comprising a mask in the path of said polarized beam.

49. The apparatus of claim 1 further comprising a mask in the path of said exposure beam.

50. The apparatus of claim 1 wherein the image from digital image data is grayscale.

51. The apparatus of claim 1 wherein said photosensitive medium is microfilm.

52. The apparatus of claim 1 wherein said media supply comprises a plurality of photosensitive media supply elements, said photosensitive media supply elements capable of simultaneously supplying said photosensitive medium for exposure at said image plane.

53. The apparatus of claim 52 wherein said photosensitive media supply elements comprise microfilm.

54. An apparatus for printing images from digital image data onto a light sensitive medium disposed at an image plane, the apparatus comprising:

(a) a control logic processor capable of controlling the operation of said apparatus for printing based on said digital image data;

(b) an image forming assembly for directing, onto said light sensitive medium disposed at said image plane, an exposure beam for printing, said image forming assembly comprising:

(1) a light source for providing light exposure energy for imaging onto said light sensitive medium;

(2) a first lens assembly for directing said light exposure energy to a spatial light modulator;

(3) a beamsplitter which directs said light exposure energy to said spatial light modulator;

(4) a temperature profile control apparatus for controlling a temperature profile of said beamsplitter;

(5) a spatial light modulator having a plurality of individual elements capable of altering a polarization state of said light exposure energy to provide an exposure beam for printing, a state of each of said elements controlled by said control logic processor according to said digital image data; and

(6) a second lens assembly for directing said exposure beam onto said light sensitive medium.

55. The apparatus of claim 54 wherein said temperature profile controller comprises a heat sink.

56. The apparatus of claim 54 wherein said temperature profile controller comprises a thermo-electric cooler.

57. The apparatus of claim 54 wherein said temperature profile controller comprises a multi-element controller.

58. The apparatus of claim 54 wherein said temperature profile controller comprises a localized environmental controller.

59. The apparatus of claim 54 wherein said temperature profile controller provides a uniform temperature profile.

60. The apparatus of claim 54 wherein said temperature profile controller comprises a calculated profile.

61. The apparatus of claim 54 wherein said second lens assembly comprises a polarizer.

62. The apparatus of claim 54 wherein said second lens assembly comprises a beamsplitter.

63. The apparatus of claim 54 wherein said second lens assembly comprises a zoom lens.

64. The apparatus of claim 54 wherein said second lens assembly comprises a turret with at least two lenses.

65. The apparatus of claim 54 wherein said spatial light modulator is movable to at least two distinct locations.

66. An apparatus for printing images from digital image data onto a light sensitive medium disposed at an image plane, the apparatus comprising:

(a) a control logic processor capable of controlling the operation of said apparatus for printing based on said digital image data;

(b) an image forming assembly for directing, onto said light sensitive medium disposed at said image plane, an exposure beam for printing, said image forming assembly comprising:

(1) a light source for providing light exposure energy for imaging onto said light sensitive medium;

(2) a first lens assembly for directing said light exposure energy to a spatial light modulator;

(3) a beamsplitter which directs said light exposure energy to said spatial light modulator;

(4) a spatial light modulator having a plurality of individual elements capable of altering a polarization state of said light exposure energy to provide an exposure beam for printing, a state of each of said elements controlled by said control logic processor according to said digital image data; and

(5) a second lens assembly for directing said exposure beam onto said light sensitive medium; and

(6) a temperature control apparatus for controlling a temperature of said light sensitive medium.

67. The apparatus of claim 66 wherein said temperature profile controller comprises a heat sink.

68. The apparatus of claim 66 wherein said temperature profile controller comprises a thermo-electric cooler.

69. The apparatus of claim 66 wherein said temperature profile controller comprises a multi-element controller.

70. The apparatus of claim 66 wherein said temperature profile controller comprises a localized environmental controller.

71. The apparatus of claim 66 wherein said temperature profile controller provides a uniform temperature profile.

72. The apparatus of claim 66 wherein said temperature profile controller comprises a calculated profile.

73. The apparatus of claim 66 wherein said second lens assembly comprises a polarizer.

74. The apparatus of claim 66 wherein said second lens assembly comprises a beamsplitter.

75. The apparatus of claim 66 wherein said second lens assembly comprises a zoom lens.

76. The apparatus of claim 66 wherein said second lens assembly comprises a turret with at least two lenses.

77. The apparatus of claim 66 wherein said spatial light modulator is movable to at least two distinct locations.

78. A method for printing from digital image data onto a light sensitive medium disposed at an image plane comprising:

(a) a control logic processor capable of controlling the operation of the apparatus for printing based on said digital image data;

(b) directing onto an exposure beam a first lens assembly;

(c) directing said exposure beam from said first lens assembly a beamsplitter;

(d) directing said beam from said beamsplitter to a spatial light modulator wherein said spatial light modulator has a plurality of individual elements capable of altering a polarization state of said light exposure energy to

provide an exposure beam for printing, a state of each of said elements controlled by said control logic processor according to said digital image data;

(e) controlling a temperature profile of said spatial light modulator;

(f) directing said beam to a second lens assembly;

(g) directing said exposure beam; and

(h) directing said exposure beam onto said light sensitive medium.

79. The method of claim 78 further comprising the step of incrementally altering a position of said spatial light modulator to dither said exposure beam.

80. A method of printing two dimensional swaths of area onto a light sensitive media using a spatial light modulator , the method comprising:

imaging light from a light source;

sequentially illuminating a first lens assembly;

passing light from said first lens assembly through a beamsplitter;

directing said light to said modulator wherein said modulator is temperature controlled; and

imaging said light through a second lens assembly to light sensitive media.

81. A method as in claim 80 wherein said light source comprises at least two distinct wavelengths.

82. A method as in claim 80 wherein backplane voltage of said modulator is varied as a function of illumination wavelength.

83. A method as in claim 80 wherein said illumination is turned off, allowing residual images to decat, turning illumination back on, printing an additional two-dimensional image.

84. A method as in claim 80 where in the spatial light modulator is moved to at least 2 distinct positions and imaged to create a composite image.

85. The method of claim 80 wherein the step of modulating said spatial light modulator comprises the step of varying the drive signal provided to an element of said spatial light modulator.

86. The method of claim 80 wherein the step of directing said exposure beam comprises the step of magnifying said exposure beam.

87. The method of claim 80 wherein the step of directing said exposure beam comprises the step of demagnifying said exposure beam.

88. The method of claim 80 wherein the step of selecting an output format comprises the step of prompting for an operator response.

89. The method of claim 80 wherein the step of modulating said uniformized source beam within a spatial light modulator in accordance with said digital data is further conditioned by said digital data to provide an exposure beam capable of printing a plurality of images at the same time.

90. The apparatus of claim 1 wherein a number of said elements of said spatial light modulator controlled by said control logic processor is proportional to said width dimension.

91. A method for printing as in claim 80 comprising:

selecting a subset of individual modulator elements on said spatial light modulator proportional to said width dimension.

92. An apparatus for printing monochrome images capable of simultaneously exposing multiple images from digital image data onto one or more segments of photosensitive media, the apparatus comprising:

(a) a media supply adapted to supply said one or more segments of photosensitive media, said one or more segments of photosensitive media having a width dimension that is one of a plurality of compatible width dimensions;

(b) a width detector for obtaining said width dimension of said photosensitive medium;

(c) a control logic processor capable of controlling the operation of the apparatus for printing based on said width dimension obtained from said width detector and on said digital image data; and

(d) an image forming assembly for directing, onto said one or more segments of photosensitive medium disposed at said image plane, an exposure beam for printing, said image forming assembly comprising:

(1) a light source for providing light exposure energy for imaging onto said one or more segments of photosensitive medium;

(2) a uniformizer for uniformizing said light exposure energy emitted from said light source;

(3) a polarizer for filtering the light uniformized by said uniformizer to provide a polarized beam having a predetermined polarization state;

(4) at least one spatial light modulator having a plurality of individual elements capable of altering the polarization state of said polarized beam to provide at least one exposure beam for printing, the state of each of said elements controlled by said control logic processor according to said digital image data;

(5) a first lens assembly for directing said polarized beam to said at least one spatial light modulator; and

(6) a second lens assembly for directing said at least one exposure beam onto said one or more segments of photosensitive medium.

93. The printing apparatus of claim 92 wherein said media supply accepts multiple film rolls.

94. The apparatus of claim 92 wherein a number of said elements of said spatial light modulator controlled by said control logic processor is proportional to said width dimension.

95. The apparatus of claim 92 wherein a number of said elements of said spatial light modulator controlled by said control logic processor is proportional to said width dimension.

96. A method for printing an image from digital image data onto a photosensitive medium, comprising:

(a) selecting, from a set of available layout formats, a selected format;

(b) correlating a grouping of exposure elements on a spatial light modulator with said selected format;

(c) modulating said grouping of exposure elements based on said digital image data;

(d) directing an exposure beam toward said spatial light modulator to provide an imaging beam; and

(e) directing said imaging beam toward said photosensitive medium.

97. The method for printing as in claim 96 wherein the step of selecting comprises the step of sensing a width dimension of said photosensitive medium.

98. The method for printing as in claim 96 wherein a member of said set of available layout formats uses a single image.

99. The method for printing as in claim 96 wherein a member of said set of available layout formats uses a plurality of images.

100. A method for printing an image from digital image data onto a photosensitive medium, comprising:

(a) selecting, from a set of available layout formats, a selected format;

(b) correlating a grouping of exposure elements on each of a plurality of spatial light modulators with said selected format;

(c) modulating said grouping of exposure elements on said each of said plurality of spatial light modulators based on said digital image data;

(d) directing an exposure beam toward said spatial light modulators to provide an imaging beam; and

(e) directing said imaging beam toward said photosensitive medium.

101. The method for printing as in claim 100 wherein said plurality of spatial light modulators are disposed on the same side of a beamsplitter element.

102. The method for printing as in claim 100 wherein said plurality of spatial light modulators are disposed on different sides of a beamsplitter element.